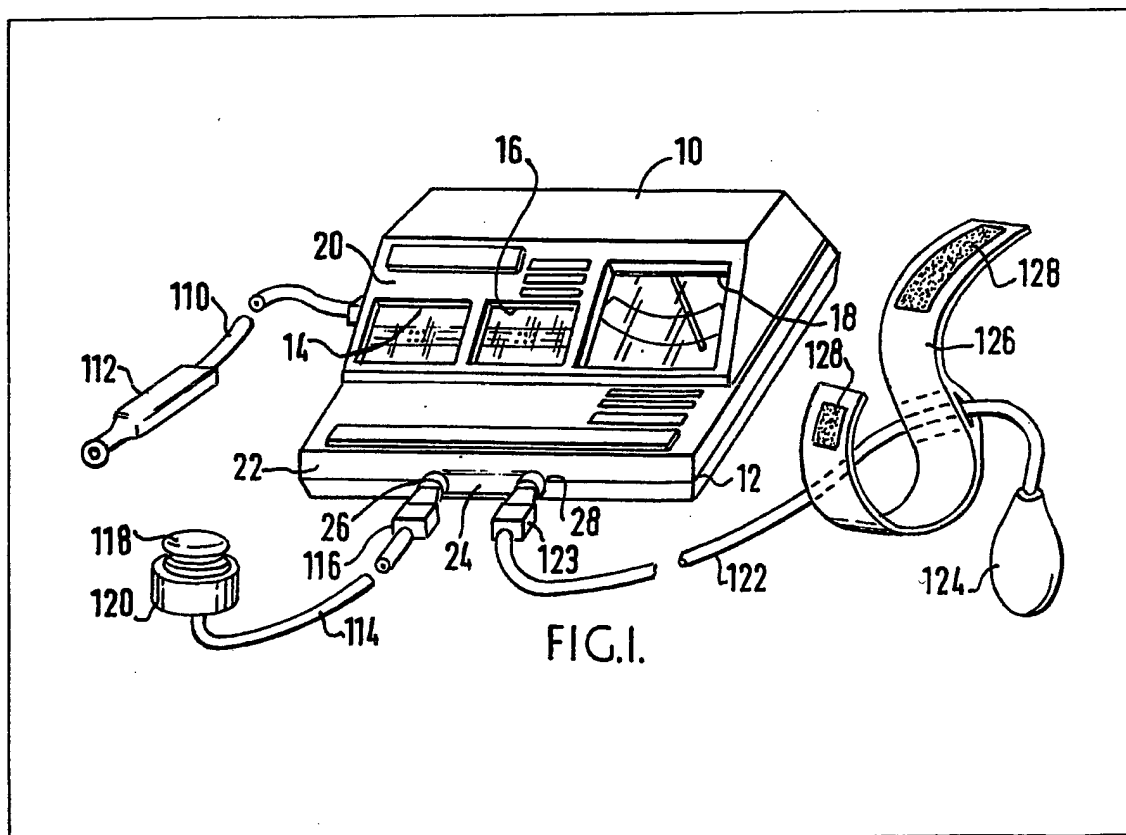


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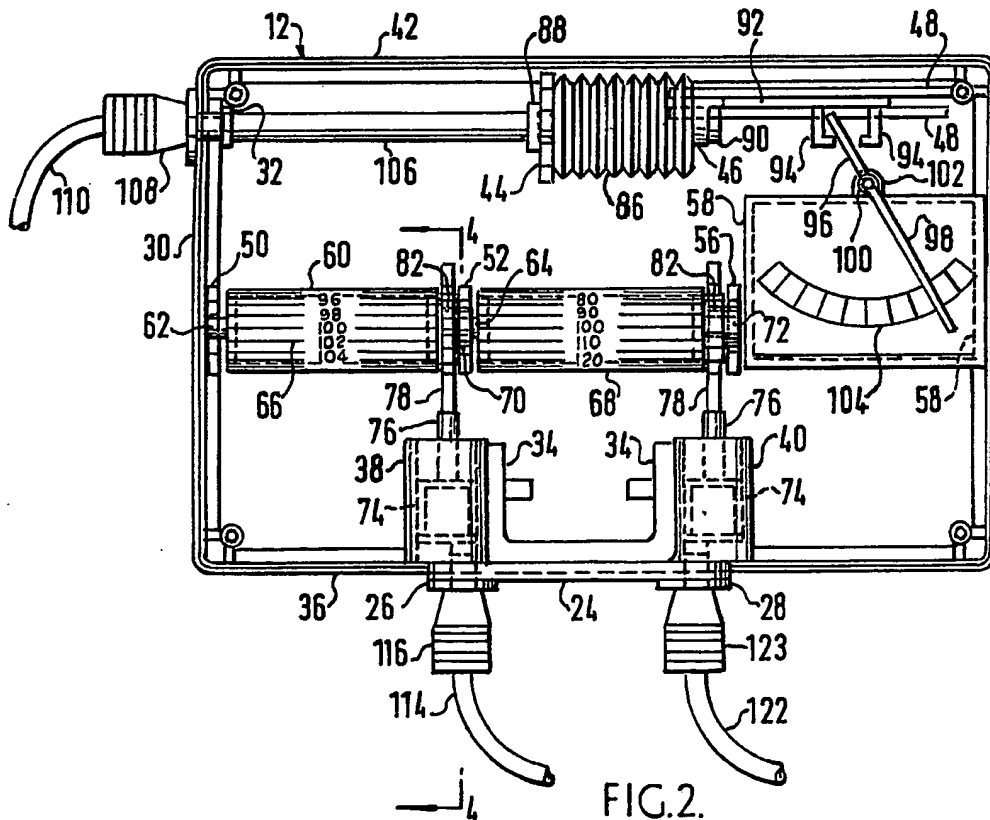
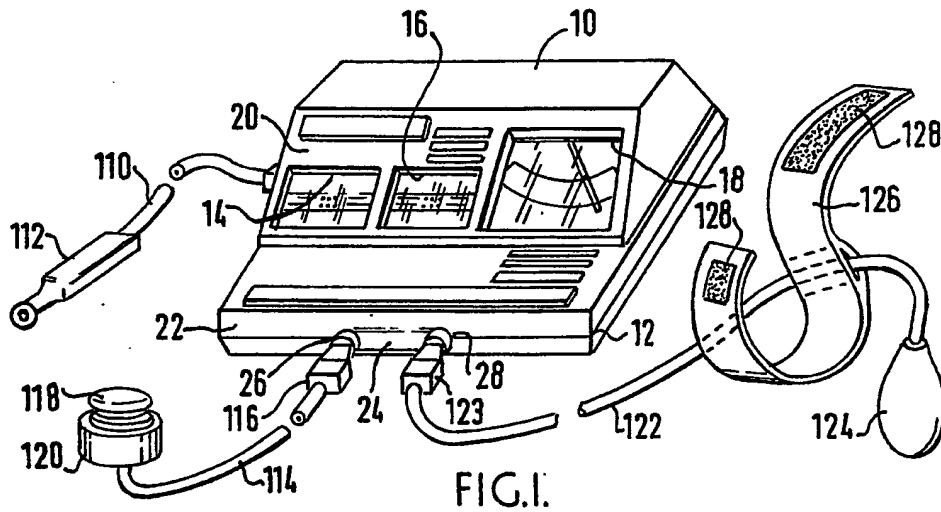
(54) Toy medical monitoring unit

(57) A toy medical monitoring unit has a housing 10 with viewing openings 14, 16 for a plurality of rotatable cylindrical drums respectively having indicia-simulating pulse rate and blood pressure. Bellows or like means 118, 124 are operable manually to rotate said drums. A dial indicating fictitious body temperature has a reference needle movable relative to said dial which is actuated by a double-acting bellows movable in one direction by blowing upon a mouth-piece 112 on a hose connected to said bellows. The resiliency of the bellows restores it to its initial position after compression.



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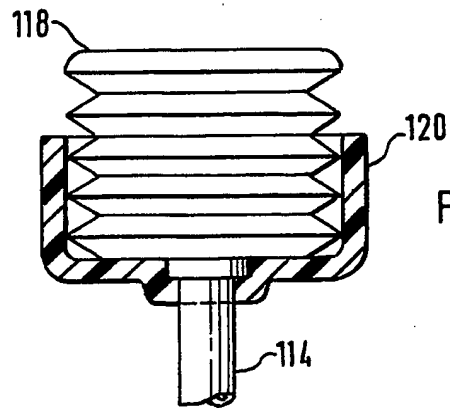


FIG. 3.

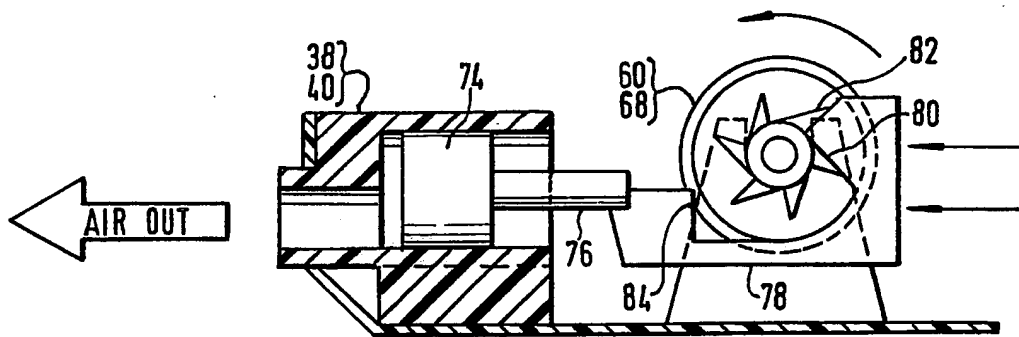


FIG. 4.

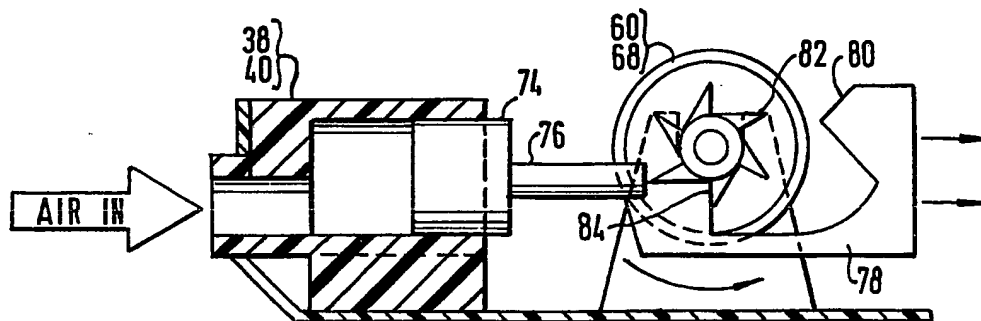


FIG. 5.

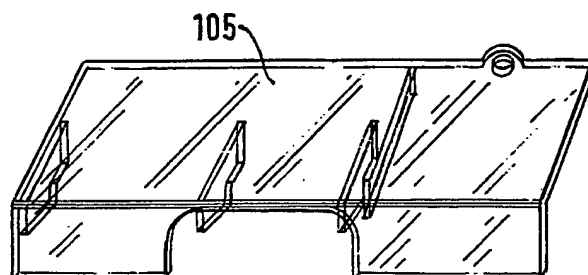


FIG. 6.

SPECIFICATION

Toy medical monitoring unit

5 This invention relates to toy medical monitoring units.

Toy medical units are very popular with young children when playing nurse or doctor and particularly when simulating the monitoring of various variables, such as pulse rate, blood pressure and temperature. Toys of this type have been developed either directly or employing indicia-viewable means and/or compressible bulbs to actuate certain dials or the like. Typical examples of such toys are found in 10 US Patent Nos. 2,588,038 to Pagendarft, dated March 4, 1952, which includes rotatable members with indicia thereon, rotatable by means of air pressure blown into one end of the device; 3,695,148 to Banginski *et al*, dated Oct. 3, 1972, which shows a toy 20 figure having gripping means actuated in various ways by a plurality of expansible and contractable bellows; and 4,174,588 to Clanton, dated Nov. 20, 1979, which pertains to a toy blood pressure monitoring device operated by a compressible bulb 25 which directs a blast of air against vanes of a rotatable member actuating a finger movable relative to a dial, the latter being associated with an arm band.

The present invention has been developed to enable a more realistic design than the devices 30 which have been developed heretofore.

It is among the principal objects of the present invention to provide a medical monitoring unit, principally made from plastics material by moulding and thereby minimizing the cost to product components 35 which are readily assembled into a completed unit, which unit includes a housing having a number of viewing openings behind which rotatable drums having indicia thereon respectively simulate the monitoring of pulse rate and blood pressure, while 40 an arcuate dial having a rotatable finger simulates body temperature.

It is a feature of the invention to actuate the aforementioned drums by automatically expansible bellows or like members which are manually operated to be compressed to direct air pressure against 45 pistons and cylinders mounted within the housing, the pistons actuating cam means to rotate the drums, and in addition, preferably lock the drums in a recording position where the indicia thereon are 50 accurately aligned with the viewing openings.

One further feature of the invention is to operate the temperature indicating dial and finger by means of another bellows operated by means of a tube 55 connected to one end thereof, a mouthpiece on the outer end of the tube for blowing into the bellows to expand the same and thereby move the needle relative to the dial in one direction, while automatic retraction of the bellows to the initial position retracts the needle to starting position.

60 Other features of the invention comprise the formation of various types of supporting means on a plastics base moulded from rigid plastics material

and having suitable guide means, open-ended bearings and the like, as well as means to cover said 65 bearings, for purposes of supporting opposite ends of the drums having cylindrical supporting bosses on opposite ends thereof received in said bearings, as well as slidable means operating the finger of the temperature recording dial, the bellows for simulating pulse rate and blood pressure also being 70 mounted on one end of tubes which are detachably connected to the housing by means of plugs and sockets and thereby simulate corresponding equipment of professional type further to increase the 75 pleasure and enjoyment of a child, as well as even presenting certain simple educational features pertaining to the operation of medical equipment of a play type.

An embodiment of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a toy medical monitoring unit embodying the present invention and having connected thereto a plurality of different 85 air-activating means operable to effect visual recording devices pertaining to certain physical conditions.

Figure 2 is a plan view from above on a larger scale of the unit shown in Figure 1 after the top portion of the housing has been removed.

90 Figure 3 is a partly sectional longitudinal view of a bellows devices mounted on one of the hoses shown in Figure 1.

Figure 4 is a diagrammatic side elevation showing a step in the operation of a visual recording device.

95 Figure 5 is a view similar to Figure 4 but showing the device in a second step following the movement illustrated in Figure 4.

Figure 6 is an exemplary interior transparent cover which overlies the elements shown in Figure 2 below 100 the top housing to retain said elements in operative position upon the supports therefor.

Referring to Figure 1, the console of a toy medical monitor unit of the present invention is composed of a top housing 10, preferably moulded from rigid 105 synthetic resin or plastics material of suitable nature and detachably mounted upon a lower base member 12 formed from similar material. The top housing 10 has a pair of like openings 14 and 16, which are illustrated as being substantially rectangular and in 110 side-by-side relationship, and a further opening 18 of larger size and substantially rectangular is disposed on the right-hand side of the housing 10, all of the openings referred to being displayed on a sloping wall 20 of the housing. The lower forward edge of 115 the housing 10 and base 12 forms a substantially vertical front wall 22, and the cooperating portions of the housing and base have elongate notches through which extends a hose coupling panel 24 provided with a pair of tubular coupling members 26 120 and 28. Referring to Figure 2, the left-hand side 30 of base 12 has yet another tubular coupling member 32 extending therethrough.

The base member 12, as indicated above, is formed by moulding from suitable relatively rigid

plastics material. It is provided with a plurality of upstanding mounting and positioning members which are formed integrally with the bottom panel of the base member 12. As shown in Figure 2, there is a pair of parallel elongate positioning ribs 34 adjacent the front edge 36 of the base and disposed between a pair of cylinders 38 and 40. These cylinders are transversely spaced but parallel to each other and are connected at the forward ends thereof by the hose coupling panel 25. Slightly spaced from the rear edge 42 of base member 12 is a pair of upstanding ribs 44 and 46 which have hemispherical notches in their upper ends. Another pair of parallel upstanding ribs 48 extend laterally from the ribs 46.

midway between the front and rear edges of base member 12 and extending in longitudinal alignment are further upstandingsupporting and positioning ribs 50, 52, 54 and 56, all of which have semi-circular notches in the upper ends thereof. Adjacent the right-hand edge of Figure 2, the base member 12 has still another parallel pair of larger upstanding ribs 58. To maintain the movable members upon the upstanding ribs, the invention preferably employs an interior intermediate transparent cover 105, as shown in Figure 6, which has complementary ribs and the like which overlie the various upstanding ribs 44, and 48-58 and the like, and which will maintain the various movable and fixed elements supported thereby accurately in the operative positions thereof. Such an interior cover 105 is secured by screws applied to certain of the circular studs on base member 12, shown in the corners of the same in Figure 2.

Referring to Figure 1, the opening 14 visibly displays a simulated pulse rate-indicating cylinder 60, shown in plan view in Figure 2. The opposite ends of the cylinder 60 have short bearing shafts 62 and 64, respectively on opposite ends thereof, which are cylindrical and rotatably disposed in the bearing notches or recesses in the upper ends of the upstanding ribs 50 and 52. The cylinder 60 also has numbered parallel lines 66 printed or otherwise formed thereon, and corresponding to imitation pulse rate indicia.

The opening 16 in the top housing 10 visibly displays a second cylinder 68, best shown in Figure 2 in plan view, which has indicia or other indications intended to simulate blood pressure indicating means. The opposite ends of the cylinder 68 have short cylindrical bearing shafts 70 and 72, the shaft 70 preferably being coaxial with an of smaller diameter than the shaft 62 of cylinder 60 and received within a socket in the bearing shaft 62 for compact arrangement of the cylinders 60 and 68.

Referring to Figure 2, the cylinders 38 and 40 are supported stationary upon the base member 12 and each of them has similar pistons 74 slidably mounted therein and provided with coaxial inwardly extending piston rods 76. Projecting farther inward from the ends of the piston rods 76 are hook-like cam members 78, including V-shaped cam ends 80, which coast with the teeth-like vanes of ratchet gears 82 fixed to one end of the drums.

Referring to Figure 5, it will be seen that as air is forced into the cylinders 38 and 40 against pistons

74, it will project a shoulder 84 against one of the teeth on the ratchet gear 82 to rotate the cylinder 60 or 68 counterclockwise, as shown by the arrows, for a partial revolution. Next, when air is exhausted from the cylinders 38 and 40, the piston will move to the left as viewed in Figure 4, and thereby cause the cam end 80 to engage another tooth of the ratchet gear 82 and advance the same with its cylinder a slight additional distance in counterclockwise direction. Such movement terminates, as viewed in Figure 4 with the cam end 80 resting between two of said teeth and locking the same in said position.

Referring to Figure 2, a self-reacting accordian-like bellows 86 has a neck and head 88 seated within the notch in upstanding rib 44 to anchor it against longitudinal movement. The opposite end of the bellows has another neck and head 90 disposed within the notch in rib 46, which is not stationary with respect to the base 12 and is movable with the head 90 of bellows 86 in an axial movement toward and from the stationary upstanding rib 44, when air is delivered to and removed from the bellows 86. The movable rib 46 extends laterally from a longitudinal slide 92, which is guided for movement slidably between the pair of upstanding ribs 48, and the opposite end of the slide 92 has a pair of L-shaped ribs 94 facing each other and between which one end 96 of an indicating needle 98 is disposed for rotatable movement of the needle about a central shaft 100 mounted in a cylindrical bearing 102 upstanding from and integral with base member 12. The pair of upstanding ribs 58 support therebetween an arcuate indicating ribs 58 support therebetween an arcuate indicating gauge 104 having radially extending gradients thereon with temperature-indicating indicia, shown in Figure 2.

The bellows 86 is connected by a hose 106 to a tubular coupling socket 32 which receives a plug 108 connected to one end of a tube 110. The tube 110 has a mouthpiece 112 on the opposite end by which a child may blow air into the tube 110 and ultimately into the bellows 86 to move the slide 92 to the right and actuate the needle 98 clockwise relative to the temperature-indicating indicia in make-believe manner to record temperature. When the blowing into the mouthpiece 112 ceases, the self-restoring nature of the bellows 86 will retract the slide 92 to the left as viewed in Figure 2 and move the needle 98 to starting position.

The pulse rate-indicating cylinder 60 is operated by an air hose 114 by means of a plug 116 on one end thereof which is received within the tubular coupling plug member 26 to communicate air to the cylinder 38 by means of a relatively short-bellows 118, as seen in Figure 3. Bellows 118 is formed of material similar to the bellows 86 and accordian-like and is partially enclosed within a rigid cup-shaped member 120 connected to the outer end of hose 114. In operation, when the bellows 118 and cup-shaped member 120 are applied against the wrist of a child and the cup member 120 is moved toward and from said wrist, pulsation of the bellows 118 will occur to generate successively air pressure and suction within the cylinder 38 and correspondingly actuate the drum 60 to result in play-like indication of a pulse

rate by the parallel line 66, for example.

Another hose 122, shown best in Figure 1, is connected at one end to another plug 124, insertable into the tubular coupling plug 28 and the opposite end thereof is connected to a collapsible and expandable bulb 124, which, if desired, may have a bellows and cup assembly 118 and 120, such as shown in Figure 3, substituted therefor. The hose 122 is fastened to a simulated arm band 126 which a child may wrap around the arm of another and fasten by securing means, such as patches of Velcro 128, and thereby imitate the blood pressure arm band normally used by physicians, but in imitation manner.

As far as convenient and readily possible, all of the components described hereinabove are formed from suitable plastics material. Where the part is preferably rigid, an appropriate rigid type of plastics is selected and, as in the case of the tubes 110, 114 and 122, a flexible type of plastics is selected, or rubber tubes may be used, if desired. Suitable clearance also provided between relatively movable parts so as to minimize, if not preclude, the possibility of binding occurring between the parts. Particularly form Figure 1, it will be seen that a relatively realistic type of medical monitor unit provided with a plurality of different air-operated indicating means respectively for simulating pulse rate, blood pressure and temperature, thereby affording substantial amusement to children playing with the same and the structure is of a rugged and durable nature and readily capable of being played with, as well as shipped, without injury, as long as reasonable care is maintained.

The foregoing description illustrates a preferred embodiment of the invention. However, changes may be made departing from the invention.

CLAIMS

1. A toy medical monitor unit to simulate registering on respective gauges of least pulse rate, blood pressure and body temperature, the unit comprising a housing having a base and viewing openings therein, two or more automatically expandable and contractable bellows or like air inlet/outlet means, two or more cylindrical drums supported within the housing adjacent corresponding viewing openings, indicia on the drums simulating at least pulse rate and blood pressure, cylinder and piston units within the housing adjacent the drums, tube means connecting one end of each bellows respectively with one end of each cylinder and operable to reciprocate the pistons in the cylinders in opposite directions by means of air movement induced by manual compression and automatic expansion of the bellows or like means, means connected to the pistons and operable to move the drums to display fictitiously at least pulse rate and blood pressure-indicating indicia on the drums in the respective viewing openings, an arcuate scale in the housing viewable through another of the viewing openings, a dial finger rotatably supported for movement of the finger relative to the scale to simulate body temperature, further bellows or like means mounted within the housing adjacent the scale and having one end anchored relative to the base of the housing, a reciprocable

member fixed to one end of the further bellows and engageable with the dial finger to rotate it relative to the scale, and a tube having one end connected to the further bellows and the other end having a mouthpiece for blowing in by a child to expand the bellows to produce movement of the dial finger in one direction, release of the pressure automatically permitting the bellows to retract and restore the dial finger to its initial position relative to the scale.

2. A toy unit according to claim 1 wherein the housing and base are formed from moulded rigid plastics material, the base having a bottom upon which open-ended bearing members extend upwardly therefrom, the drums also being moulded from rigid plastics material and having closed ends supporting cylindrical bosses rotatably supported in the open-ended bearing members, and transparent means overlying the drums and having means thereon engaging the open-ended bearing members to close the same and maintain the bosses therein.

3. A toy unit according to claim 1 or 2 in which the two or more bellows are moulded from self-restoring elastic plastics material and are cylindrically accordion in shape, one end thereof closed and the other having an opening to receive one end of a tube and the closed end being adapted to be pressed manually toward the other end to produce air pressure and the resilient nature of the plastic material being operable to restore the bellows to the initial expanded shape to produce suction within the tubes and the cylinders connected thereto, thereby to operate the drums.

4. A toy unit according to claim 1, 2 or 3 in which the further bellows has a connecting member on the closed end thereof and the reciprocable member is a plate-like member having means to receive the connecting member for firm connection therewith, means on the base slidably supporting the plate-like member and the latter having means to receive a prong on the dial finger for operable connection the plate-like member and the base having a bearing socket for a shaft on the dial finger to rotatably support the same.

5. A toy unit according to any preceding claim, in which the housing has sockets thereon respectively to receive plugs connected to the tubes connected to the two or more bellows on the ends leading to the cylinders, means fixedly supporting the cylinders within the housing and the plugs being disconnectable in the sockets communicating with the cylinders, and the means connected to the pistons to move the drums comprising cam members reciprocally supported by the base, the drums having ratchet gears on one end thereof in alignment with the reciprocable cam members and operable in one direction to rotate the drums in one direction to effect display of indicia on the drums in the viewing openings in the housing.

6. A toy unit according to claim 5 in which the cam means has two operative members thereon engageable with the ratchet gears, one of the members being engageable with the ratchet means when the bellows is compressed to cause air pressure to move the piston and cam means in one advancing direction to move the drums in one direction for a

- segment of rotation and the other cam member being operable to engage another segment of the ratchet gears when the piston is moved in the opposite direction by suction caused by expansion of the bellows and thereby to effect further segmental movement of the drum in the direction to complete a predetermined segment of movement of the drum to align an indicia on the drum with a viewing opening in the housing.
- 5
- 10 7. A toy unit according to claim 6 in which the other cam member is shaped to be received between a pair of teeth on the ratchet gears at the completion of the segmental movement of the drum thereby and lock the drum in the completed rotational movement
- 15 thereof and maintain the same in the position until the bellows is again compressed.

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